Exercise Sheet 9
Due: January 8, 2013

Exercise 9.1 (Belief revision, 3 marks)
Consider the following description:

Bob is organizing a party for Xmas. Mary and Tom said they will come together. Peter said he won’t come if Mary is here and Judea said he will come only if Peter is here.

At the last minute, Mary learns that she is unable to come because her mother is ill.

Propose a formalization of this description within propositional logic and perform both a Dalal revision of it and a full-meet revision.

Exercise 9.2 (Belief revision, 4 marks)
Show that a revision operator satisfying the condition on faithful assignements as given in the theorem by Katsuno-Mendelzon respects all the AGM postulates reformulated by Katsuno and Mendelzon.

Exercise 9.3 (Cut base revision, 3 marks)
Let $A = A_1 \cup \cdots \cup A_n$ a belief set and let the cut base revision of $A$ by $\phi$ by defined as:

$$ (A \otimes \phi) \overset{\text{def}}{=} \mathcal{Cn} \left( \bigcup \{A_j \mid 1 \leq j \leq n \land \bigcup_{i=j}^n A_i \not\models \neg \phi \} \right) + \phi. $$

Show that the problem of whether a formula $\psi$ belongs to $A \otimes \phi$ is in $\mathcal{P}^\mathcal{NP}$. 